

FACT SHEET

as required by LAC 33:IX.2411, for draft **Louisiana Pollutant Discharge Elimination System Permit No. LA0053716; AI 8832; PER20060001** to discharge to waters of the State of Louisiana as per LAC 33:IX.2311.

The permitting authority for the Louisiana Pollutant Discharge Elimination System (LPDES) is:

Louisiana Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

- I. THE APPLICANT IS:** City of Bossier City
Red River Wastewater Treatment Plant
Post Office Box 5337
Bossier City, LA 71171
- II. PREPARED BY:** Todd Franklin
- DATE PREPARED:** April 19, 2006
- III. PERMIT ACTION:** reissue LPDES permit LA0053716, AI 8832; PER20060001
- LPDES application received: February 13, 2006
- EPA has not retained enforcement authority.
- LPDES permit issued: August 1, 2001
LPDES permit expired: July 31, 2006

IV. FACILITY INFORMATION:

- A. The application is for the discharge of treated sanitary wastewater from a publicly owned treatment works serving the western and southern portions of Bossier City including Barksdale AFB.
- B. The permit application does indicate the receipt of industrial wastewater. The industrial dischargers include:

<u>Name of Discharger</u>	<u>Flow</u>
Auto Chlor Services	0.000375 MGD
Barksdale Air Force Base	0.50 MGD
Jones Environmental	0.0121 MGD
Key Energy Services	0.00025 MGD
Martin Transport	0.0023 MGD
Schlumberger	0.033 MGD
Superior Well Service	0.001 MGD

- C. The facility is located at 3512 Barksdale Boulevard in Bossier City, Bossier Parish.
- D. The treatment facility consists of an extended aeration treatment plant. Disinfection is by chlorination.

E. Outfall 001

Discharge Location: Latitude 32° 28' 58" North
Longitude 93° 41' 11" West

Description: treated sanitary wastewater

Design Capacity: 8 MGD

Type of Flow Measurement which the facility is currently using:

Combination Totalizing Meter / Continuous Recorder

V.

RECEIVING WATERS:

The discharge is into the Red River in segment 100101 of the Red River Basin. This segment is listed on the 303(d) list of impaired waterbodies.

The critical low flow (7Q10) of the Red River is 1223.79 cfs.

The hardness value is 186.65 mg/l and the fifteenth percentile value for TSS is 26.27 mg/l.

The designated uses and degree of support for Segment 100101 of the Red River Basin are as indicated in the table below^{1/}:

Overall Degree of Support for Segment	Degree of Support of Each Use						
	Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
Partial	Full	Full	Not Supported	N/A	Not Supported	N/A	Full

^{1/} The designated uses and degree of support for Segment 100101 of the Red River Basin are as indicated in LAC 33:IX.1123.C.3, Table (3) and the 2004 Water Quality Management Plan, Water Quality Inventory Integrated Report, Appendix A, respectively.

VI. ENDANGERED SPECIES:

The receiving waterbody, Subsegment 100101 of the Red River Basin, is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U. S. Fish and Wildlife Service (FWS). This strategy was submitted with a letter dated October 21, 2005, from Watson (FWS) to Gautreaux (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat.

VII. HISTORIC SITES:

The discharge is from an existing facility location, which does not include an expansion beyond the existing perimeter. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the 'Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits' no consultation with the Louisiana State Historic Preservation Officer is required.

VIII. PUBLIC NOTICE:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit modification and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the statement of basis. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

For additional information, contact:

Mr. Todd Franklin
Permits Division
Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

IX. PROPOSED PERMIT LIMITS:

Subsegment 100101, Red River-Arkansas State Line to Alexandria, is listed on LDEQ's Final 2004 303(d) List as impaired for sulfates and color. To date no TMDLs have been completed for this waterbody. A reopener clause will be established in the permit to allow for the requirement of more stringent effluent limitations and requirements as imposed by a TMDL. Until completion of TMDLs for the Red River Basin, those suspected causes for impairment which are not directly attributed to the sanitary wastewater point source category have been eliminated in the formulation of effluent limitations and other requirements of this permit. Additionally, suspected causes of impairment which could be attributed to pollutants which were not determined to be discharged at a level which would cause, have the reasonable potential to cause or contribute to an excursion above any present state water quality standard were also eliminated.

Sulfates and Color

According to the 2004 305(b) Report, the sulfates impairment is attributed to sources outside state jurisdiction or borders and natural sources and the color impairment is attributed to upstream sources. Because the discharge consists of treated sanitary wastewater, which is not listed as a cause for the sulfates or color impairment, no requirements for these parameters shall be placed into the permit.

The previous LPDES permit contained water quality based limits for Total Residual Chlorine (TRC). As per LAC 33:IX.2707.L.2.a.ii availability of information which was not available at the time of previous permit issuance and will justify the application of less stringent effluent limitations in the proposed permit constitutes an exception to LAC 33:IX.2707.L.1 which states when a permit is renewed or reissued, standards or conditions must be at least as stringent as the final limitations, standards, or conditions in the previous permit.

The previous LPDES permit required water quality based limits of less than 0.1 mg/l instantaneous maximum for TRC. A geometric average was found for TRC using DMR data from the months of January 2004 through December 2005. The resultant geometric average was evaluated in a water quality screen, and did not indicate the continuing need for effluent limitations for TRC. Because of this, and due to the fact that the receiving waterbody is not listed on the 303(d) list as being impaired for TRC, TRC limitations have been removed from the permit.

Final Effluent Limits:**OUTFALL 001**

Final limits shall become effective on the effective date of the permit and expire on the expiration date of the permit.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
BOD ₅	2002	30 mg/l	45 mg/l	Limits are set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSEL) for facilities of this treatment type and size.
TSS	2002	30 mg/l	45 mg/l	Since there is no numeric water quality criterion for TSS, and in accordance with the current Water Quality Management Plan, the TSS effluent limitations shall be based on a case-by-case evaluation of the treatment technology being utilized at a facility. Therefore, a Technology Based Limit has been established through Best Professional Judgement for the type of treatment technology utilized at this facility.

Other Effluent Limitations:**1) Fecal Coliform**

The discharge from this facility is into a water body which has a designated use of Primary Contact Recreation. According to LAC 33:IX.1113.C.5.b.i, the fecal coliform standards for this water body are 200/100 ml and 400/100 ml. Therefore, the limits of 200/100 ml (Monthly Average) and 400/100 ml (Weekly Average) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgement in order to ensure that the water body standards are not exceeded, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) pH

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C, the pH shall not be less than 6.0 standard

units nor greater than 9.0 standard units at any time.

3) Solids and Foam

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

Toxicity Characteristics

In accordance with EPA's Region 6 Post-Third Round Toxics Strategy, permits issued to treatment works treating domestic wastewater with a flow (design or expected) greater than or equal to 1 MGD shall require biomonitoring at some frequency for the life of the permit or where available data show reasonable potential to cause lethality, the permit shall require a whole effluent toxicity (WET) limit (*Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards*, September 27, 2001 VERSION 4).

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates the effects of synergism of the effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. LAC 33:IX.1121.B.3. provides for the use of biomonitoring to monitor the effluent for protection of State waters. The biomonitoring procedures stipulated as a condition of this permit are as follows:

The permittee shall submit the results of any biomonitoring testings performed in accordance with the LPDES Permit No. LA0053716, **Biomonitoring Section** for the organisms indicated below.

TOXICITY TESTS

FREQUENCY

48 Hour Definitive Toxicity Test
using Daphnia pulex

1/quarter

48 Hour Definitive Toxicity Test
using fathead minnow (Pimephales promelas)

1/quarter

Dilution Series - The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional concentrations shall be 12%, 17%, 22%, 29%, and 39%. The low-flow effluent concentration (critical low-flow dilution) is defined as 29% effluent. The critical dilution is calculated in Appendix B-1 of this fact sheet. According to the Implementation of State Standards, acute toxicity testing in addition to, or in lieu of, chronic toxicity testing may be imposed for discharges that have a critical dilution of five percent (5%) or less. An acute to chronic ratio has been applied in the calculations. Results of all dilutions shall be documented in a full report according to the test method publication mentioned in the **Biomonitoring Section** under Whole Effluent Toxicity. This full report shall be submitted to the Office of Environmental Compliance as contained in the Reporting Paragraph located in the **Biomonitoring Section** of the permit.

The permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.2383. Accelerated or intensified toxicity testing

may be required in accordance with Section 308 of the Clean Water Act.

If there are no lethal effects demonstrated after the first year of quarterly testing, the permittee may certify fulfillment of the WET testing requirements in writing to the permitting authority. If granted, the monitoring frequency for the test species may be reduced to not less than once per year for the less sensitive species (usually *Pimephales promelas*) and not less than twice per year for the more sensitive species (usually *Daphnia pulex*). Upon expiration of the permit, the monitoring frequency for both species shall revert to once per quarter until the permit is reissued.

X.

PREVIOUS PERMITS:

LPDES Permit No. LA0053716: Issued: August 1, 2001

Expired: July 31, 2006

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
	<u>Daily Avg.</u>	<u>Daily Max.</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow	Report	Report	Continuous	Recorder
BOD ₅	30 mg/l	45 mg/l	5/week	12 Hour Composite
TSS	30 mg/l	45 mg/l	5/week	12 Hour Composite
TRC	less than 0.1 mg/l		5/week	Grab
Fecal Coliform				
Colonies/100 ml	200	400	5/week	Grab
pH	Range (6.0 su – 9.0 su)		5/week	Grab
Biomonitoring				
<i>Pimephales promelas</i>	Report	Report	1/quarter	24-hour comp.
<i>Daphnia pulex</i>	Report	Report	1/quarter	24-hour comp.

The permit contains a fully approved pretreatment program.

The permit contains biomonitoring.

The permit contains pollution prevention language.

XI.

ENFORCEMENT AND SURVEILLANCE ACTIONS:

A) Inspections

A review of the files indicates the following inspections were performed during the period beginning February 2004 and ending February 2006 for this facility.

Date – June 22, 2004

Inspector - LDEQ

Findings and/or Violations -

An industrial pretreatment inspection was conducted and the following was noted:

1. The pretreatment program was approved in 1983 and modified in 1993.
2. A system for regulating and enforcing industrial wastewater discharges to the city POTW is in place and is being implemented.
3. Two of the 16 permitted industrial users were visited during the inspection.
4. The city's Industrial Pretreatment Program appears to be well organized and

implemented.

Date – February 17, 2005

Inspector - LDEQ

Findings and/or Violations –

1. The WWTP was operating satisfactory. The design capacity is 8.0 MGD and the hydraulic influent capacity is 20 MGD. The WWTP also has a 29 million gallon capacity equalization basin.
2. DMRs revealed no effluent permit exceedances in 2004.
3. The facility's flow meter was operating satisfactory and read -2.8% of actual flow.
4. An occasional problem with the dilution water test during the BOD₅ test was noted. The facility's reverse osmosis water treatment system has been repaired. All other QA/QC procedures with BOD₅ and all other analysis were satisfactory.
5. The facility has good process control tests to ensure proper operation and maintain of the WWTP. The facility also has additional sludge wasting treatment works to ensure high quality effluent.

Date – February 8, 2006

Inspector - LDEQ

Findings and/or Violations –

- The facility's permit requires effluent flow to be continuously recorded. The facility's flow meter was not operating properly. The facility's effluent flow meter read -13.03% of actual flow. Acceptable flow meter readings are +/- 10% of actual flow. The flow meter was last calibrated in January 2005.

B) Compliance and/or Administrative Orders

A review of the files indicates that no recent enforcement actions have been administered against this facility.

C) DMR Review

A review of the discharge monitoring reports for the period beginning January 2004 through December 2005 has revealed no violations.

XII.

ADDITIONAL INFORMATION:

Please be aware that the Department will be conducting a TMDL in the Red River Basin scheduled for completion in 2007. The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions as a result of the TMDL. Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

The nearest drinking water intakes, Bossier City Water System and Shreveport Water System are both located upstream from the discharge point. Therefore, monitoring for Toxic Substances will not be a requirement for this permit.

Final effluent loadings (i.e. lbs/day) have been established based upon the permit limit concentrations and the design capacity of 8 MGD.

Effluent loadings are calculated using the following example:

$$\text{BOD}_5: 8.34 \text{ gal/lb} \times 8 \text{ MGD} \times 30 \text{ mg/l} = 2,001.6 \text{ lb/day}$$

At present, the **Monitoring Requirements, Sample Types, and Frequency of Sampling** are listed below. The monitoring frequencies for CBOD₅, TSS, and Fecal Coliform have been reduced based on the EPA Guidance for Performance Based Reductions of Monitoring Frequencies.

<u>Effluent Characteristics</u>		<u>Monitoring Requirements</u>	
		<u>Measurement</u>	<u>Sample</u>
		<u>Frequency</u>	<u>Type</u>
Flow		Continuous	Recorder
BOD ₅		1/week	12 Hr. Composite
Total Suspended Solids		1/week	12 Hr. Composite
Fecal Coliform Bacteria		1/week	Grab
Biomonitoring	<u>Daphnia pulex</u>	1/quarter ¹	24 Hr. Composite
	<u>Pimephales promelas</u>	1/quarter ¹	24 Hr. Composite
pH		5/week	Grab

¹ If there are no lethal effects demonstrated after the first year of quarterly testing, the permittee may certify fulfillment of the WET testing requirements in writing to the permitting authority. If granted, the monitoring frequency for the test species may be reduced to not less than once per year for the less sensitive species (usually *Pimephales promelas*) and not less than twice per year for the more sensitive species (usually *Daphnia pulex*). Upon expiration of the permit, the monitoring frequency for both species shall revert to once per quarter until the permit is reissued.

Pretreatment Requirements

Based upon consultation with LDEQ pretreatment personnel, the City of Bossier City began implementing an approved pretreatment program on January 25, 1983 and this program is tracked under LA0053716. The Bossier City Pretreatment Program was modified on January 22, 1993, to incorporate an Enforcement Response Plan. A pretreatment audit of this program was conducted on November 6-8, 2002, and it indicated that the program is being implemented in a manner sufficient to regulate the industrial users. Therefore, it is recommended that LDEQ Option 2A Pretreatment Language be included in LPDES Permit LA0053716. This language is established for municipalities with industrial users on their collection system and with an approved pretreatment program. This recommendation is in accordance with 40 CFR 403 Regulations and the Best Professional Judgement (BPJ) of the reviewer.

Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. The permittee will accomplish this requirement by completing an Environmental Audit Form which has been attached to the permit. All other requirements of the Municipal Wastewater Pollution Prevention Program are contained in Part II of the permit.

The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	12 Months from Audit Period Beginning Date	3 Months from Audit Period Ending Date

XIII**TENTATIVE DETERMINATION:**

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in this Statement of Basis.

XIV**REFERENCES:**

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 8, "Wasteload Allocations / Total Maximum Daily Loads and Effluent Limitations Policy," Louisiana Department of Environmental Quality, 2005.

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 5, "Water Quality Inventory Section 305(b) Report," Louisiana Department of Environmental Quality, 1998.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 11 - "Louisiana Surface Water Quality Standards," Louisiana Department of Environmental Quality, 2004.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Subpart 2 - "The LPDES Program," Louisiana Department of Environmental Quality, 2004.

Low-Flow Characteristics of Louisiana Streams, Water Resources Technical Report No. 22, United States Department of the Interior, Geological Survey, 1980.

Index to Surface Water Data in Louisiana, Water Resources Basic Records Report No. 17, United States Department of the Interior, Geological Survey, 1989.

LPDES Permit Application to Discharge Wastewater, City of Bossier City, Red River Wastewater Treatment Plant, February 13, 2006.

APPENDIX I

APPENDIX I

Numeric Toxic Limits: LDEQ has reviewed and evaluated the effluent analyses submitted by the permittee on February 13, 2006, and examined the following pollutants that are regulated by LAC 33:IX.1113.C.6. in accordance with the implementation procedures outlined under the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, October 30, 1995. Please see Appendix B-1, Water Quality Screen Spreadsheet.

Pollutant	Ce ¹	Ce x 2.13 ²	Water Quality Based Limit ³	Drinking Water Source	Permit Limit ?
Total Zinc	39.7 µg/L	84.561 µg/L	103.35 lbs/day	Yes ⁴	No

- 1/ Metals concentration results were presented as total metals in lab analysis submitted by the permittee. All pollutants calculated in µg/l.
- 2/ For the reported effluent concentrations (Ce) it is estimated that 95% of the concentrations of chemicals taken over time will be 2.13 times the Ce or less.
- 3/ The water quality based limit is the maximum allowable instream concentration for that pollutant to be in compliance with water quality standards. Louisiana Water Quality Criteria for metals are hardness dependent, and expressed as dissolved metals. The water quality based limit is calculated with a conversion for metals limits expressed as total metals.
- 4/ See Additional Information on Page 9 of this Fact Sheet.

The following steps were used in evaluating the potential toxicity of the analyzed pollutants (see Appendix B-1):

- i. An evaluation of the applicability of the effluent data.

Results of the PPS were entered and compared to EPA's Minimum Quantification Levels (MQL's) to determine the potential presence of the respective toxic pollutant. Those pollutants with reported laboratory Method Detection Levels (MDL's) which exceed their respective EPA MQL's are determined to be reasonably present in the effluent and an evaluation of their potential toxicity is determined. Those pollutants with MDLs less than the MQL are determined to be not potentially present in the effluent and eliminated from further evaluation.

- ii. Calculation of permit limits based on applicable water quality standards.

Applicable water quality criteria are listed in the Appendix B-1 in Columns 12-14. These values were used to calculate the Waste Load Allocations (WLAs) for each of the toxic pollutants. The WLA is the maximum allowable concentration of a pollutant necessary to meet the respective water quality criteria. The WLAs are calculated as described in the State's Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, dated October 30, 1995, as follows (Zinc is used as the example pollutant for the following calculations):

Complete Mix Balance Model for Waste Load Allocation

Qe	=	plant effluent, MGD = 8
Qr	=	critical flow of receiving stream, 1223.79 cfs
Fs	=	MZ, ZID flow fraction, LAC 33:IX.1115.D.7 and 8 (MZ = 0.33, and ZID = 0.033)
Cr	=	numerical criteria value from LAC 33:IX.1113, Table 1
Cu	=	ambient instream concentration for pollutant. In the absence of accurate supporting data, assume Cu = 0
WLA	=	concentration for pollutant at end-of-pipe based on aquatic life and human health numerical criteria (site specific dilution type)
LTA	=	long term average, units same as WLA
WQBL	=	effluent water quality based limit.

$$\text{Dilution factor} = \frac{Q_e}{(Q_r F_s + Q_e)}$$

$$\begin{aligned} \text{Dilution factor (acute)} &= \frac{8}{(1223.79)(0.6463)(0.033) + 8} \\ &= 0.233 \end{aligned}$$

$$\begin{aligned} \text{Dilution factor (chronic)} &= \frac{8}{(1223.79)(0.6463)(1.0) + 8} \\ &= 0.0295 \end{aligned}$$

$$\text{WLA} = (\text{Cr/Dilution factor}) - (F_s Q_r C_u / Q_e)$$

iii. Conversion of dissolved metals criteria for aquatic life to total metals.

Metals criteria for aquatic life protection are based on dissolved metals concentrations and hardness values averaged from data compilations contained in the Louisiana Water Quality Data Summary. A dissolved to total metal conversion will be implemented. Hardness and TSS are a function of the conversion. This involves determining a linear partition coefficient for the metal of concern and using this to determine the fraction of metal dissolved, so that the dissolved metal ambient criteria may be translated to a total effluent limit. The average hardness value used for the analysis is 186.65 mg/l CaCO₃ (USGS data). The 15th percentile TSS value is 26.27 mg/l. The formula for converting dissolved metals to total metals for streams and lakes are provided below.

K _p	=	Linear partition coefficient
K _{po}	=	found in Table A below
α	=	found in Table A below
TSS	=	total suspended solids concentration found in receiving stream or approximation thereof (nearest most representative site), lowest 15th percentile, units in mg/l
C _D /C _T	=	Fraction of metal dissolved
Cr	=	Dissolved criteria value for metal in water quality standards

$$K_p = K_{po} \times TSS^\alpha$$

$$K_p = (1.25 \times 10^6) \times 26.27^{(-0.7)}$$

$$\text{then, } \frac{C_D}{C_T} = \frac{1}{1 + (K_p)(TSS)(10^{-6})}$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (126849.267)(26.27)(10^{-6})}$$

$$= 0.231$$

therefore,

$$\text{Total Metal} = \frac{C_r}{(C_D/C_T)}$$

TABLE A
LINEAR PARTITION COEFFICIENTS
FOR PRIORITY METALS IN STREAMS AND LAKES

(Delos *et. al.*, 1984) (*1)

METAL	STREAMS		LAKES	
	K_{po}	α	K_{po}	α
Arsenic	0.48×10^6	-0.73	0.48×10^6	-0.73
Cadmium	4.00×10^6	-1.13	3.52×10^6	-0.92
Chromium III (*2)	3.36×10^6	-0.93	2.17×10^6	-0.27
Copper	1.04×10^6	-0.74	2.85×10^6	-0.9
Lead	2.80×10^6	-0.8	2.04×10^6	-0.53
Mercury	2.90×10^6	-1.14	1.97×10^6	-1.17
Nickel	0.49×10^6	-0.57	2.21×10^6	-0.76
Zinc	1.25×10^6	-0.7	3.34×10^6	-0.68

(*1) Delos, C. G., W. L. Richardson, J. V. DePinto, R. B. Ambrose, P. W. Rogers, K. Rygwelski, J. P. St. John, W. J. Shaughnessey, T. A. Faha, W. N. Christie. Technical Guidance for performing Waste Load Allocations, Book II: Streams and Rivers. Chapter 3: Toxic Substances, for the U. S. Environmental Protection Agency. (EPA-440/4-84-022).

(*2) Linear partition coefficients shall not apply to the Chromium VI numerical criterion. The approved analytical method for Chromium VI measures only the dissolved form. Therefore, permit limits for Chromium VI shall be expressed in the dissolved form. See 40 CFR 122.45(c)(3).

$$WLA_{a,c,h} = (Cr/Dilution\ factor) - (FsQrCu/Qe)$$

$$WLA_{acute} = (840.89/0.235) - [(0.033)(1223.79)(0)/8] = 3,695.309$$

$$WLA_{chronic} = (797.33/0.0297) - [(0.33)(1223.79)(0)/8] = 26,457.413$$

iv. Calculation of Long Term Averages (LTA's) and Permit Limits.

Comparison of the reported effluent data (converted to the 95th percentile) to the calculated effluent limitations. Long term averages are listed in the Appendix B-1 in Columns 15-17.

Long term averages are calculated for each WLA (based on aquatic and human health criteria). The LTA's are calculated as follows:

$$LTA_a = WLA_a \times 0.32$$

$$LTA_c = WLA_c \times 0.53$$

$$LTA_h = WLA_h$$

$$LTA_{acute} = 3,695.309 \times 0.32 = 1,182.499$$

$$LTA_{chronic} = 26,457.413 \times 0.53 = 14,022.429$$

A comparison of each LTA is made and the lowest (most restrictive) is selected to calculate the effluent limitations. The most limiting LTA is listed in Appendix B-1, Column 18.

Calculation of permit limits if aquatic life LTA is more limiting:

$$\text{Daily Average} = \text{Min}(LTA_a, LTA_c) \times 1.31$$

$$\text{Daily Maximum} = \text{Min}(LTA_a, LTA_c) \times 3.11$$

$$\text{Daily Average} = 1,182.499 \times 1.31 = 1,549.073 \mu\text{g/l}$$

$$\text{Daily Maximum} = 1,182.499 \times 3.11 = 3,677.572 \mu\text{g/l}$$

If human health LTA is more limiting:

$$\text{Daily Average} = LTA_h$$

$$\text{Daily Maximum} = LTA_h \times 2.38$$

The resulting allowable effluent concentration is converted to a mass value using the following formula:

$$\begin{aligned} \text{lbs/day} &= (1.549073 \text{ mg/l}) \times 8.34 \times 8 \text{ MGD} \\ &= 103.354 \text{ lbs/day} \end{aligned}$$

Comparison of the reported effluent data (converted to 95th percentile) is made to the calculated effluent limitations. Water Quality Based limits are listed in Appendix B-1, Columns 19-22.

In accordance with the State of Louisiana's implementation procedures, the reported effluent concentration is compared to the calculated daily average concentration. If the effluent concentration is greater than the calculated daily average concentration, then a reasonable potential exists and an effluent limitation for the pollutant of concern is imposed in the permit. (Please refer to Appendix B-1 for the calculated daily average concentration listed in Column 19 and the effluent concentration listed in Column 3.)

The discharge is considered to pose a reasonable potential to cause a water quality excursion if the estimated 95th percentile of a pollutant in the effluent will result in an instream waste concentration, which is above the applicable State water quality criterion. The 95th percentile of possible effluent concentrations are estimated as follows:

$$C_{95} = C_{\text{mean}} * \exp (1.645 * \Phi - 0.5 * \Phi^2)$$

where: 1.645 = normal distribution factor at 95th percentile

$$\Phi^2 = \ln(CV^2 + 1)$$

if CV is assumed = 0.6,

$$\Phi^2 = .307$$

The ratio of the estimated 95th percentile value to the mean (C_{95}/C_{mean}) is calculated :

$$C_{95}/C_{\text{mean}} = 2.13$$

Based upon review of the permittee's effluent data, there are no pollutants present or potentially present in the effluent discharge in such concentrations which would cause an exceedance of Louisiana's Water Quality Standards. A summary of the evaluation of the permittee's effluent analysis of the toxic pollutants is listed in Appendix B-1.

APPENDIX B-1

Water Quality Screen

wqsmoan.wk4
Developer: Bruce Fielding
Software: Lotus 4.0
Revision date: 10/22/99

Water Quality Screen for City of Bossier City / Red River Wastewater Treatment Plant

Input variables:

Receiving Water Characteristics:

Receiving Water Name=
Critical flow (Qr) cfs=
Harm. mean/avg tidal cfs=
Drinking Water=1 HHNPCR=2
Marine, 1=y, 0=n
Rec. Water Hardness=
Rec. Water TSS=
Fisch/Specific=1, Stream=0
Diffuser Ratio=

Red River

1223.79

7227

186.65

26.27

Dilution:
ZID Ff =

0.033333333

MZ Ff =

0.333333333

Critical Qr (MGD)=

790.935477

Harm. Mean (MGD)=

4670.8101

ZID Dilution =

0.232798274

MZ Dilution =

0.029450184

HHnc Dilution=

0.010013324

HHc Dilution=

0.001709836

ZID Upstream =

3.295564488

MZ Upstream =

32.95564488

MZhhnc Upstream=

98.86693463

City of Bossier City / Red River Wastewater Treatment Plant

LA0053716

8

001

MZhhnc Upstream=

583.8512625

ZID Hardness=

--

MZ Hardness=

--

ZID TSS=

--

MZ TSS=

--

Multipliers:

WLAa -> LTAA

0.32

WLAc -> LTAc

0.53

LTA a,c->WQBL avg

1.31

LTA a,c->WQBL max

3.11

LTA h -> WQBL max

2.38

WQBL-limit/report

2.13

WLA Fraction

1

WQBL Fraction

1

Appendix B-1

1

1

Fischer/Site Specific inputs:

Pipe=1, Canal=2, Specific=3

Pipe width, feet

ZID plume dist., feet

MZ plume dist., feet

HHnc plume dist., feet

HHc plume dist., feet

Fischer/site specific dilutions:

ZID Dilution =

Fspecific MZ Dilution =

Fspecific HHnc Dilution=

Fspecific HHc Dilution=

Toxicity Dilution Series:

Biomonitoring dilution:

Dilution Series Factor:

0.294501843

0.75

Percent Effluent

39.267%

29.4502%

22.0876%

16.5657%

12.4243%

Partition Coefficients; Dissolved->Total

METALS

Total Arsenic

2.160100081

Total Cadmium

3.61532199

Chromium III

5.223781878

Chromium VI

1

Total Copper

3.432724664

Total Lead

6.383318136

Total Mercury

2.835158534

Total Nickel

2.997854754

Total Zinc

4.332330245

FW

2.160100081

3.61532199

5.223781878

1

3.432724664

6.383318136

2.835158534

2.997854754

4.332330245

Aquatic Life, Dissolved

Metal Criteria, ug/L

METALS

Arsenic

360

Cadmium

68.11362807

Chromium III

2895.009389

Chromium VI

16

Copper

34.55614562

Lead

180.6960642

Mercury

2.4

Nickel

2404.585898

Zinc

198.5678766

ACUTE

360

68.11362807

2895.009389

16

34.55614562

180.6960642

2.4

2404.585898

198.5678766

CHRONIC

190

1.851498819

345.0687364

11

21.81028141

7.041466206

0.012

267.3164022

179.8514063

Site Specific Multiplier Values:

CV =

--

N =

--

WLAa -> LTAA

--

WLAc -> LTAc

--

LTA a,c->WQBL avg

--

LTA a,c->WQBL max

--

LTA h -> WQBL max

--

(*1) Toxic Parameters	(*2) Cu Effluent /Tech ug/L	(*3) Effluent /Tech (Avg)	(*4) Effluent /Tech (Max)	(*5) MQL Effluent i=No 95% 0-95 %	(*6) 95th % Non-Tech estimate ug/L	(*7) Numerical Criteria Acute FW	(*8) Chronic FW	(*9) HHNDW ug/L	(*10) Carcinogen Indicator "C"	(*11) HH Indicator
NONCONVENTIONAL										
Total Phenols (4AAP)				5		700	350	50		
3-Chlorophenol				10						
4-Chlorophenol				10		383	192			
2,3-Dichlorophenol				10						
2,5-Dichlorophenol				10						
2,6-Dichlorophenol				10						
3,4-Dichlorophenol				10						
2,4-Dichlorophenoc-										
acetic acid (2,4-D)										
2-(2,4,5-Trichlorophen-										
oxy) propionic acid										
(2,4,5-TP, Silvex)										
METALS AND CYANIDE										
Total Arsenic				10		777.6360291	410.4190153			
Total Cadmium				1		246.254755	6.693820325			
Chromium III				10		15122.89758	1802.563812			
Chromium VI				10		16	11			
Total Copper				10		118.6217334	74.86869093			
Total Lead				5		1153.440464	44.94791894			
Total Mercury				0.2		6.804380482	0.034021902			
Total Nickel				40		7208.599263	801.375747			
Total Zinc				20		8415.61860361616	779.175681			
Total Cyanide				20		45.9	5.4			
DIOXIN										
2,3,7,8 TCDD; dioxin	1.00E-05							7.20E-07	C	
VOLATILE COMPOUNDS										
Benzene				10		2249	1125	12.5	C	
Bromoform				10		2930	1465	34.7	C	
Bromodichloromethane				10				3.3	C	
Carbon Tetrachloride				10		2730	1365	1.2	C	
Chloroform				10		2890	1445	70	C	
Dibromochloromethane				10				5.08	C	
1,2-Dichloroethane(EDC)				10		11800	5900	6.8	C	
1,1-Dichloroethylene				10		1160	580	0.58	C	
1,3-Dichloropropylene				10		606	303	162.79		
Ethylbenzene				10		3200	1600	8100		
Methyl Chloride				50		55000	27500			
Methylene Chloride				20		19300	9650	87	C	
1,1,2,2-Tetrachloro-										
ethane				10		932	466	1.8	C	

(*1) Toxic Parameters	(*12) WLAa Acute ug/L	(*13) WLAc Chronic ug/L	(*14) WLAh HHNDW ug/L	(*15) LTAA Acute ug/L	(*16) LTAc Chronic ug/L	(*17) LTAh HHNDW ug/L	(*18) Limiting A.C.HH ug/L	(*19) WQBL Avg 001	(*20) WQBL Max 001	(*21) WQBL Avg 001	(*22) (*23) WQBL Need Max WQBL7 lbs/day
NONCONVENTIONAL											
Total Phenols (4AAP)	3006.895141	11884.47571	4993.346731	962.2064452	6298.772124	4993.346731	962.2064452	1260.490443	2992.462045	84.09992237	199.6570676
3-Chlorophenol	---	---	---	---	---	---	---	---	---	---	no
4-Chlorophenol	1645.201199	6519.483816	---	526.4643836	3455.326422	---	526.4643836	689.6683425	1637.304233	46.01467181	109.2409384
2,3-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	no
2,5-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	no
2,6-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	no
3,4-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	no
2,4-Dichlorophenoxy- acetic acid (2,4-D)	---	---	---	---	---	---	---	---	---	---	no
2-(2,4,5-Trichlorophen- oxy) propionic acid (2,4,5-TP, Silvex)	---	---	---	---	---	---	---	---	---	---	no
METALS AND CYANIDE											
Total Arsenic	3340.385711	13936.04234	---	1068.923427	7386.102438	---	1068.923427	1400.28969	3324.351859	93.42732811	221.8007561
Total Cadmium	1057.803181	227.2929858	---	338.4970178	120.4652825	---	120.4652825	157.8095201	374.6470285	10.52905118	24.99644974
Chromium III	64961.3818	61207.21666	---	20787.64218	32439.82483	---	20787.64218	72731.81125	64649.56717	1816.906447	4313.419121
Chromium VI	68.7290318	373.5120936	---	21.99329018	197.9614096	---	21.99329018	28.81121013	68.39913245	1.92228394	4.563590117
Total Copper	509.5473053	2542.214681	---	163.0551377	1347.373781	---	163.0551377	213.6022304	507.1014782	14.25154081	33.83381063
Total Lead	4954.677894	1526.235573	---	1585.496926	808.9048538	---	808.9048538	1059.665359	2515.694095	70.70087272	167.84711
Total Mercury	29.22865516	1.155235636	---	9.353169651	0.612274887	---	0.612274887	0.802080102	1.904174899	0.053514784	0.127046549
Total Nickel	30965.003	27211.23028	---	9908.80096	14421.95205	---	9908.80096	12980.52926	30816.37099	866.0609121	2056.068272
Total Zinc	36955.09254	2645741293	---	1182569861	1402742885	---	1182569861	5397073639	327757177	1033519327235365885	no
Total Cyanide	197.16641	183.3604823	1282690.908	63.09325119	97.18105563	1282690.908	63.09325119	82.65215906	196.2200112	5.514552053	13.09179915

DIOXIN

2,3,7,8 TCDD, dioxin

---	---	4.21E-04	---	---	4.21E-04	4.21E-04	4.21E-04	1.00E-03	2.81E-05	6.69E-05	no
-----	-----	----------	-----	-----	----------	----------	----------	----------	----------	----------	----

VOLATILE COMPOUNDS

Benzene

Bromoforn

Bromodichloromethane

Carbon Tetrachloride

Chloroform

Dibromochloromethane

1,2-Dichloroethane(EDC)

1,3-Dichloroethylene

1,3-Dichloropropylene

Ethylbenzene

Methyl Chloride

Methylene Chloride

1,1,2,2-Tetrachloro-
ethane

9660.724532	38200.10048	7310.640781	3091.43185	20246.05326	7310.640781	3091.43185	4049.775724	9614.333055	270.2010363	641.4696358	no
12586.00395	49745.01974	20294.33881	4027.521263	26364.86046	20294.33881	4027.521263	5276.052855	12525.59113	352.0182465	835.7074402	no
---	---	1930.009166	---	---	1930.009166	1930.009166	1930.009166	4593.421816	128.7702116	306.4731035	no
11726.89105	46349.45525	701.821515	3752.605136	24565.21128	701.821515	701.821515	701.821515	1670.335206	46.82553148	111.4447649	no
12414.18137	49065.90684	40939.58838	3972.538038	26004.93063	40939.58838	3972.538038	5204.02483	12354.5933	347.2125366	824.2984649	no
---	---	2971.044413	---	---	2971.044413	2971.044413	2971.044413	7071.085704	198.2280833	471.7828382	no
50687.66095	200338.3048	3976.988585	16220.0515	106179.3015	3976.988585	3976.988585	9465.232832	265.3446784	631.5203346	---	no
4982.854806	19694.27403	339.2137323	1594.513538	10437.96523	339.2137323	339.2137323	807.3286828	22.63234022	53.86496971	---	no
2603.112079	10288.5604	16257.33829	832.9958654	5452.93701	16257.33829	832.9958654	1091.224584	2590.617141	72.80650422	172.8459757	no
13745.80636	54329.0318	808922.1705	4398.658035	28794.38685	808922.1705	4398.658035	5762.242026	13679.82649	384.456788	912.7180234	no
236256.0468	933780.2341	---	75601.93498	494903.5241	---	75601.93498	99038.53482	235122.0178	6607.851043	15687.34103	no
82904.39461	327671.973	50882.05984	26529.40627	173666.1457	50882.05984	26529.40627	34753.52222	82506.45351	2318.755003	5504.830578	no
4003.466102	15823.33051	1052.732273	1281.109153	8386.365171	1052.732273	1052.732273	2505.502809	70.23829722	167.1671474	---	no

Other Parameters:
Fecal Colif. (col/100ml)

Fecal Colif. (col/100ml)

Fecal Colif. (col/100ml)

Chlorine

Ammonia

Chlorides

Sulfates

Fecal Colif. (col/100ml)

APPENDIX B-2

**Documentation and Explanation of
Water Quality Screen and
Associated Lotus Spreadsheet**

APPENDIX B-2
LA0053716/AI 8832/PER20060001

**Documentation and Explanation of Water Quality Screen
and Associated Lotus Spreadsheet**

Each reference column is marked by a set of parentheses enclosing a number and asterisk, for example (*1) or (*19). These columns represent inputs, existing data sets, calculation points, and results for determining Water Quality Based Limits for an effluent of concern. The following represents a summary of information used in calculating the water quality screen:

Receiving Water Characteristics:

Receiving Water: Red River
Critical Flow, Qrc (cfs): 1223.79 cfs
Harmonic Mean Flow, Qrh (cfs): cfs
Segment(s) No.: 100101
Receiving Stream Hardness: 186.65 mg/l
Receiving Stream TSS: 26.27 mg/l
MZ Stream Factor, Fs: 0.33 cfs
Plume distance, Pf: N/A

Effluent Characteristics:

Company: City of Bossier City / Red River Wastewater Treatment Plant
Facility flow, Qe (MGD): 8 MGD
Effluent Hardness: N/A
Effluent TSS: N/A
Pipe/canal width, Pw: N/A
Permit Number: LA0053716

Variable Definition:

Qrc, critical flow of receiving stream: 1223.79 cfs
Qrh, harmonic mean flow of the receiving stream, cfs
Pf = Allowable plume distance in feet, specified in LAC 33.IX.1115.D
Pw = Pipe width or canal width in feet
Qe, total facility flow, 8 MGD
Fs, stream factor from LAC.IX.33.11 (1 for harmonic mean flow)
Cu, ambient concentration, ug/L
Cr, numerical criteria from LAC.IX.1113, Table 1
WLA, wasteload allocation
LTA, long term average calculations
WQBL, effluent water quality based limit
ZID, Zone of Initial Dilution in % effluent
MZ, Mixing Zone in % effluent

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Formulas used in aquatic life water quality screen (dilution type WLA):

Streams: Dilution Factor =
$$\frac{Q_e}{(Q_{rc} \times 0.6463 \times F_s + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(F_s \times Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies (in the absence of a site specific dilution):

Discharge from a pipe:

Discharge from a canal:

Critical
Dilution =
$$\frac{(2.8) P_w \pi^{1/2}}{Pf}$$

Critical
Dilution =
$$\frac{(2.38)(P_w^{1/2})}{(Pf)^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf}{(2.8) P_w \pi^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf^{1/2}}{2.38 P_w^{1/2}}$$

Formulas used in human health water quality screen, human health non-carcinogens (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Formulas used in human health water quality screen, human health carcinogens (dilution type WLA):

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rh} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rh} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies in the absence of a site specific dilution (human health carcinogens and human health non-carcinogens):

Discharge from a pipe:

Discharge from a canal:

Critical
Dilution =
$$\frac{(2.8) P_w \pi^{1/2}}{Pf}$$

Critical
Dilution =
$$\frac{(2.38)(P_w^{1/2})}{(Pf)^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf^*}{(2.8) P_w \pi^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf^{1/2*}}{2.38 P_w^{1/2}}$$

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Page 3

* Pf is set equal to the mixing zone distance specified in LAC 33:IX.1115 for the static water body type, i.e., lake, estuary, Gulf of Mexico, etc.

If a site specific dilution is used, WLA are calculated by subtracting Cu from Cr and dividing by the site specific dilution for human health and aquatic life criteria.

$$WLA = \frac{(Cr - Cu)}{\text{site specific dilution}}$$

Longterm Average Calculations:

$$LTAa = WLAa \times 0.32$$

$$LTAc = WLAc \times 0.53$$

$$LTAh = WLAh$$

WQBL Calculations:

Select most limiting LTA to calculate daily max and daily avg WQBL

If aquatic life LTA is more limiting:

$$\text{Daily Maximum} = \text{Min}(LTAa, LTAc) \times 3.11$$

$$\text{Monthly Average} = \text{Min}(LTAc, LTAa) \times 1.31$$

If human health LTA is more limiting:

$$\text{Daily Maximum} = LTAh \times 2.38$$

$$\text{Monthly Average} = LTAh$$

Mass Balance Formulas:

$$\text{mass (lbs/day)}: (\text{ug/L}) \times 1/1000 \times (\text{flow, MGD}) \times 8.34 = \text{lbs/day}$$

$$\text{concentration(ug/L)}: \frac{\text{lbs/day}}{(\text{flow, MGD}) \times 8.34 \times 1/1000} = \text{ug/L}$$

The following is an explanation of the references in the spreadsheet.

- (*1) Parameter being screened.
- (*2) Instream concentration for the parameter being screened in ug/L. In the absence of accurate supporting data, the instream concentration is assumed to be zero (0).
- (*3) Monthly average effluent value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*4) Daily maximum value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*5) Minimum analytical Quantification Levels (MQL's). Established in a letter dated January 27, 1994 from Wren Stenger of EPA Region 6 to Kilren Vidrine of LDEQ and from the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". The applicant must test for the parameter at a level at least as sensitive as the specified MQL. If

this is not done, the MQL becomes the application value for screening purposes if the pollutant is suspected to be present on-site and/or in the waste stream. Units are in ug/l or lbs/day depending on the units of the effluent data.

- (*6) States whether effluent data is based on 95th percentile estimation. A "1" indicates that a 95th percentile approximation is being used, a "0" indicates that no 95th percentile approximation is being used.
- (*7) 95th percentile approximation multiplier (2.13). The constant, 2.13, was established in memorandum of understanding dated October 8, 1991 from Jack Ferguson of Region 6 to Jesse Chang of LDEQ and included in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". This value is screened against effluent Water Quality Based Limits established in columns (*18) - (*21). Units are in ug/l or lbs/day depending on the units of the measured effluent data.
- (*8) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, acute criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations using the following formula: $(\text{Effluent Hardness} \times \text{ZID Dilution} + \text{Receiving Stream Hardness} \times (1 - \text{ZID Dilution}))$. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations using the following formula: $(\text{Effluent TSS} \times \text{ZID Dilution} + \text{Receiving Stream TSS} \times (1 - \text{ZID Dilution}))$.

Hardness Dependent Criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(1.1280[\ln(\text{hardness})] - 1.6774)}$
Chromium III	$e^{(0.8190[\ln(\text{hardness})] + 3.6880)}$
Copper	$e^{(0.9422[\ln(\text{hardness})] - 1.3884)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 1.4600)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 3.3612)}$
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.8604)}$

Dissolved to Total Metal Multipliers for Freshwater Streams (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
Arsenic	$1 + 0.48 \times \text{TSS}^{-0.73} \times \text{TSS}$
Cadmium	$1 + 4.00 \times \text{TSS}^{-1.13} \times \text{TSS}$
Chromium III	$1 + 3.36 \times \text{TSS}^{-0.93} \times \text{TSS}$
Copper	$1 + 1.04 \times \text{TSS}^{-0.74} \times \text{TSS}$
Lead	$1 + 2.80 \times \text{TSS}^{-0.80} \times \text{TSS}$
Mercury	$1 + 2.90 \times \text{TSS}^{-1.14} \times \text{TSS}$
Nickel	$1 + 0.49 \times \text{TSS}^{-0.57} \times \text{TSS}$
Zinc	$1 + 1.25 \times \text{TSS}^{-0.70} \times \text{TSS}$

Dissolved to Total Metal Multipliers for Marine Environments (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
Copper	$1 + (10^{4.86} \times \text{TSS}^{-0.72} \times \text{TSS}) \times 10^{-6}$
Lead	$1 + (10^{6.06} \times \text{TSS}^{-0.85} \times \text{TSS}) \times 10^{-6}$
Zinc	$1 + (10^{5.36} \times \text{TSS}^{-0.52} \times \text{TSS}) \times 10^{-6}$

If a metal does not have multiplier listed above, then the dissolved to total metal multiplier shall be 1.

- (*9) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, chronic criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations using the following formula: (Effluent Hardness X MZ Dilution + Receiving Stream Hardness X (1 - MZ Dilution)). Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used,

however, a flow weighted TSS may be determined in site-specific situations using the following formula: (Effluent TSS X MZ Dilution + Receiving Stream TSS X (1-MZ Dilution)).

Hardness dependent criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(0.7852[\ln(\text{hardness})] - 3.4900)}$
Chromium III	$e^{(0.8473[\ln(\text{hardness})] + 0.7614)}$
Copper	$e^{(0.8545[\ln(\text{hardness})] - 1.3860)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 4.7050)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 1.1645)}$
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.7614)}$

Dissolved to total metal multiplier formulas are the same as (*8), acute numerical criteria for aquatic life protection.

- (*10) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, human health protection, drinking water supply (HHDW), non-drinking water supply criteria (HHNDW), or human health non-primary contact recreation (HHNPCR) (whichever is applicable). A DEQ and EPA approved Use Attainability Analysis is required before HHNPCR is used, e.g., Monte Sano Bayou. Units are specified.
- (*11) C if screened and carcinogenic. If a parameter is being screened and is carcinogenic a "C" will appear in this column.
- (*12) Wasteload Allocation for acute aquatic criteria (WLAa). Dilution type WLAa is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the acute aquatic numerical criteria for that parameter. Units are in ug/L. Dilution WLAa formulas for streams:

$$WLAa = (Cr/\text{Dilution Factor}) - \frac{(Fs \times Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Dilution WLAa formulas for static water bodies:

$$WLAa = (Cr - Cu)/\text{Dilution Factor}$$

Cr represents aquatic acute numerical criteria from column (*8).

If Cu data is unavailable or inadequate, assume Cu=0

- (*13) Wasteload Allocation for chronic aquatic criteria (WLAc). Dilution type WLAc is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the chronic aquatic numerical criteria for that parameter. Units are in ug/L. Dilution WLAc formula:

$$WLAc = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAc formulas for static water bodies:

$$WLAc = (Cr-Cu)/Dilution\ Factor)$$

Cr represents aquatic chronic numerical criteria from column (*9).
If Cu data is unavailable or inadequate, assume Cu=0

- (*14) Wasteload Allocation for human health criteria (WLAh). Dilution type WLAh is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the human health numerical criteria for that parameter. Units are in ug/L. Dilution WLAh formula:

$$WLAh = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc, Qrh \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAh formulas for static water bodies:

$$WLAh = (Cr-Cu)/Dilution\ Factor)$$

Cr represents human health numerical criteria from column (*10).

If Cu data is unavailable or inadequate, assume Cu=0

- (*15) Long Term Average for aquatic numerical criteria (LTAA). WLAA numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.32. $WLAA \times 0.32 = LTAA$
- (*16) Long Term Average for chronic numerical criteria (LTAc). WLAc numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.53. $WLAc \times 0.53 = LTAc$
- (*17) Long Term Average for human health numerical criteria (LTAh). WLAh numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 1. $WLAc \times 1 = LTAh$
- (*18) Limiting Acute, Chronic or Human Health LTA's. The most limiting LTA is placed in this column. Units are consistent with the WLA calculation.
- (*19) End of pipe Water Quality Based Limit (WQBL) maximum 30-day monthly average in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 1.31 to determine the average WQBL ($LTA_{limiting\ aquatic} \times 1.31 = WQBL_{daily\ average}$). If human health criteria was the most limiting criteria then $LTAh = WQBL_{daily\ average}$.

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- (*20) End of pipe Water Quality Based Limit (WQBL) 30-day daily maximum in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 3.11 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 3.11 = WQBL_{\text{daily max}}$). If human health criteria was the most limiting criteria then LTA_h is multiplied by 2.38 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 2.38 = WQBL_{\text{daily max}}$).
- (*21) End of pipe Water Quality Based Limit (WQBL) maximum 30-day monthly average in terms of mass, lbs/day. The mass limit is determined by using the mass balance equations above. Daily average WQBL, ug/l/1000 X facility flow, MGD X 8.34 = daily average WQBL, lbs/day.
- (*22) End of pipe Water Quality Based Limit (WQBL) 30 day daily maximum in terms of mass, lbs/day. Mass limit is determined by using the mass balance equations above. Daily maximum WQBL, ug/l/1000 X facility flow, MGD X 8.34 = daily maximum WQBL, lbs/day.

WQBL CALCULATIONS

WQBL CALCULATIONS FOR CITY OF BOSSIER CITY / RED RIVER WASTEWATER TREATMENT PLANT LA0053716, AI 8832

DESIGN CAPACITY (Q_e): 8 MGD

CRITICAL LOW FLOW (7Q10): 1,223.79 cfs.

HARDNESS VALUE: 186.65 mg/L

FIFTEENTH PERCENTILE VALUE FOR TSS: 26.27 mg/L

PRIORITY POLLUTANT: ZINC

- $$\begin{aligned} \text{Zn (Acute)} &= e^{(0.8473 [\ln(\text{hardness})] + 0.8604)} \times CF \\ &= e^{(0.8473 [\ln 186.65] + 0.8604)} \times 0.978 \\ &= e^{(0.8473) (5.229235205) + 0.8604} \times 0.978 \\ &= e^{5.291130989} \times 0.978 \\ &= 198.5678605 \times 0.978 \\ &= 194.1993675 = 194.20 \mu\text{g/L} \end{aligned}$$

- $$\begin{aligned} \text{Zn (Chronic)} &= e^{(0.8473 [\ln(\text{hardness})] + 0.7614)} \times CF \\ &= e^{(0.8545 [\ln 186.65] + 0.7614)} \times 0.986 \\ &= e^{(0.8545) (5.229235205) + 0.7614} \times 0.986 \\ &= e^{5.229781483} \times 0.986 \\ &= 186.7519906 \times 0.986 \\ &= 184.1374627 = 184.14 \mu\text{g/L} \end{aligned}$$

DISSOLVED TO TOTAL METAL CONVERSION

$$\frac{C_D}{C_T} = \frac{1}{1 + (K_p) (\text{TSS}) (10^{-6})}$$

$$K_p = K_{po} \times \text{TSS}^a$$

$$K_p = 1.25 \times 10^6 \times 26.27^{(-0.7)}$$

$$= 126849.267$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (126849.267) (26.27) (10^{-6})}$$

$$= \frac{1}{4.332330244}$$

$$= 0.230822662 = 0.231$$

$$\frac{\text{TOTAL}}{\text{DISSOLVED}} = \frac{C_T}{C_D} = 4.33$$

	DISSOLVED	X	C_T / C_D	=	TOTAL
Acute Criteria	194.20 µg/L	X	4.33	=	840.89 µg/L
Chronic Criteria	184.14 µg/L	X	4.33	=	797.33 µg/L
Human Health _{nc}	5000 µg/L	X	4.33	=	21650 µg/L

DILUTION

	DISSOLVED	TOTAL
ACUTE	194.20 µg/L	840.89 µg/L
CHRONIC	184.14 µg/L	797.33 µg/L
HUMAN HEALTH	5000 µg/L	21650 µg/L

DILUTION CALCULATIONS

$$\text{DILUTION FACTOR} = \frac{Q_e}{Q_r \times F_s + Q_e}$$

- ZID (ACUTE) = $\frac{8 \text{ MGD}}{(1223.79 \text{ cfs})(0.6463 \text{ MGD/cfs})(0.033 \text{ cfs}) + 8 \text{ MGD}} = 0.235$
- MZ (CHRONIC) = $\frac{8 \text{ MGD}}{(1223.79 \text{ cfs})(0.6463 \text{ MGD/cfs})(0.33 \text{ cfs}) + 8 \text{ MGD}} = 0.0297$
- HH (HUMAN HEALTH) = $\frac{8 \text{ MGD}}{(1223.79 \text{ cfs})(0.6463 \text{ MGD/cfs})(1 \text{ cfs}) + 8 \text{ MGD}} = 0.0100$

CONCLUDE THAT:

23.5% of effluent at edge of ZID
 2.97% of effluent at edge of MZ
 1.00% of effluent at edge of HH_{nc}

WASTELOAD ALLOCATION CALCULATIONS

$$WLA = \frac{C_r}{\text{Dilution}} = \frac{F_s \times C_r \times C_u}{Q_e} \quad C_u = 0$$

- $WLA_{ZID} \text{ (ACUTE)} = \frac{840.89 \text{ } \mu\text{g/L}}{0.235} = 3,578.26 \text{ } \mu\text{g/L}$
- $WLA_{MZ} \text{ (CHRONIC)} = \frac{797.33 \text{ } \mu\text{g/L}}{0.0297} = 26,846.13 \text{ } \mu\text{g/L}$
- $WLA_{HH} \text{ (HUMAN HEALTH)} = \frac{21650 \text{ } \mu\text{g/L}}{0.01} = 2,165,000 \text{ } \mu\text{g/L}$

LTA CALCULATIONS

- $LTA_{ZID} \text{ (ACUTE)} = WLA_{ZID} \times 0.32$
 $= 3,578.26 \text{ } \mu\text{g/L} \times 0.32 = 1,145.04 \text{ } \mu\text{g/L}$
- $LTA_{MZ} \text{ (CHRONIC)} = WLA_{MZ} \times 0.53$
 $= 26,846.13 \text{ } \mu\text{g/L} \times 0.53 = 14,228.45 \text{ } \mu\text{g/L}$
- $LTA_{HH} \text{ (HUMAN HEALTH)} = WLA_{HH} \times 1$
 $= 2,165,000 \text{ } \mu\text{g/L} \times 1 = 2,165,000 \text{ } \mu\text{g/L}$

WQBL CALCULATIONS

$$\text{LIMITING LTA} = 1,145.04 \text{ } \mu\text{g/l}$$

- $\text{MONTHLY AVERAGE} = \text{LIMITING LTA} \times 1.31$
 $= 1,145.04 \text{ } \mu\text{g/L} \times 1.31$
 $= 1,500.00 \text{ } \mu\text{g/L}$
 $= 1.5 \text{ mg/L} \times 8 \text{ MGD} \times 8.34 \text{ lbs/day} = 100.08 \text{ lbs/day}$
- $\text{DAILY MAXIMUM} = \text{LIMITING LTA} \times 3.11$
 $= 1,145.04 \text{ } \mu\text{g/L} \times 3.11$
 $= 3,561.07 \text{ } \mu\text{g/L}$
 $= 3.56107 \text{ mg/L} \times 8 \text{ MGD} \times 8.34 \text{ lbs/day} = 237.59 \text{ lbs/day}$

STREAM FLOW CHARACTERISTICS REPORT

MEMORANDUM

TO: Jeremy "Todd" Franklin

FROM: George Chike

DATE: February 22, 2006

RE: Stream Flow and Water Quality Characteristics for Red River, receiving stream for the City of Bossier City's Red River Wastewater Treatment Plant with Permit No. LA 0053716/AI 8832

Determinations of water quality characteristics for the outfall was taken from a DEQ monitoring station #120 on Red River at the bridge on I-220, about 0.9 mile east of the intersection of I-220 and US Hwy 71, approximately 3.0 miles north of Shreveport. The following results were obtained;

Average hardness = 186.65 mg/l
15th percentile TSS = 26.27 mg/l

Based on the available data, the flow figures were determined as follows:

7Q10 = 1223.79 CFS
Harmonic Mean = 7227 CFS

If you have additional questions or comments, please contact me at 2-3467.

GC:gc

BIOMONITORING REQUIREMENTS

BIOMONITORING FREQUENCY RECOMMENDATION AND RATIONALE FOR ADDITIONAL REQUIREMENTS

Permit Number: **LA0053716**
 Facility Name: **City of Bossier City – Red River WWTP**
 Previous Critical Dilution: **28%** Proposed Critical Dilution: **29% (10:1 ACR)**
 Date of Review: **02/24/06** Name of Reviewer: **Kim Gunderson**

Recommended Frequency by Species:

Pimephales promelas (Fathead minnow): **Once/Quarter¹**
Daphnia pulex (water flea): **Once/Quarter¹**

Recommended Dilution Series: **12%, 17%, 22%, 29%, and 39%**

Number of Tests Performed during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **19**
Daphnia pulex (water flea): **21 (2 retests)**
Daphnia magna (water flea): **N/A – Testing of species was not required**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

Number of Failed Tests during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **No failures on file during the past 5 years**
Daphnia pulex (water flea): **1**
Daphnia magna (water flea): **N/A – Testing of species was not required**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

Failed Test Dates during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **N/A – No failures on file during the past 5 years**
Daphnia pulex (water flea): **Test period: 09/01/01 – 11/30/01**
Daphnia magna (water flea): **N/A – Testing of species was not required**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

Previous TRE Activities: **N/A – No previous TRE Activities**

¹ If there are no lethal effects demonstrated after the first year of quarterly testing, the permittee may certify fulfillment of the WET testing requirements in writing to the permitting authority. If granted, the monitoring frequency for the test species may be reduced to not less than once per year for the less sensitive species (usually *Pimephales promelas*) and not less than twice per year for the more sensitive species (usually *Daphnia pulex*). Upon expiration of the permit, the monitoring frequency for both species shall revert to once per quarter until the permit is re-issued.

Additional Requirements (including WET Limits) Rationale / Comments Concerning Permitting:

The City of Bossier City – Red River WWTP owns and operates an existing publicly owned treatment works facility serving Bossier City and Barksdale Airforce Base in Bossier City, Bossier Parish, Louisiana. LPDES Permit LA0053716, effective August 1, 2001, contained freshwater acute biomonitoring as an effluent characteristic of Outfall 001 for *Daphnia pulex* and *Pimephales promelas*. The effluent series consisted of 12%, 16%, 21%, 28%, and 38% concentrations, with the 28% effluent concentration being defined as the critical dilution. The testing was to be performed quarterly for *Daphnia pulex* and *Pimephales promelas*. Data on file indicate that the permittee experienced one lethal failure to the *Daphnia pulex* during the test period 09/01/01-11/30/01. Subsequent retests passed at the NOEC values of 38% and 28%.

To adequately assess the facility's effluent potential for receiving stream and/or aquatic species toxicity, it is recommended that freshwater acute biomonitoring continue to be an effluent characteristic of Outfall 001 (design capacity of 8 MGD for treated sanitary wastewater) in LA0053716. The effluent dilution series shall be 12%, 17%, 22%, 29%, and 39% concentrations, with the 29% effluent concentration being defined as the critical dilution (the 10:1 Acute-to-Chronic ratio has been implemented because the critical dilution was less than 5%). In accordance with the Environmental Protection Agency (Region 6) WET testing frequency acceleration(s), the biomonitoring frequency shall be once per quarter for *Daphnia pulex* and *Pimephales promelas*. If there are no significant lethal effects demonstrated at or below the critical dilution during the first four quarters of testing, the permittee may certify fulfillment of the WET testing requirements to the permitting authority and WET testing may be reduced to not less than once per six months for the more sensitive species (*Daphnia pulex*) and not less than once per year for the less sensitive species (*Pimephales promelas*) for the remainder of the term of the permit. Upon expiration of the permit, the monitoring frequency for both test species shall revert to once per quarter until the permit is re-issued.

This recommendation is in accordance with the LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, EPA Region 6 Post-Third Round Whole Effluent Toxicity Testing Frequencies (Revised June 30, 2000), and the Best Professional Judgement (BPJ) of the reviewer.

PRETREATMENT REQUIREMENTS

PRETREATMENT EVALUATION AND RECOMMENDATION

FACILITY NAME: *City of Bossier City / Red River WWTP*

CITY: *Bossier City*

PARISH: *Bossier*

PERMIT #: *LA0053716*

DESIGN FLOW: *8 MGD*

ACTUAL FLOW: *7 MGD*

OTHER POTWs IN SYSTEM: *Bossier City/Northeast WWTP (LA0065978)*

SIGNIFICANT INDUSTRIES LISTED IN MANUFACTURERS GUIDE:

Industry Name	Type of Industry	Direct or Indirect Discharger
Anders Signs	Magnetic, metal, painted, plastic, wooden and vinyl lettered signs	Indirect ¹
American Block Co.	Manufactures concrete blocks	Direct ²
Auto Chlor Services	Manufacturer of liquid detergents	Indirect ³
Barksdale Air Force Base	Military air operations and support services	Indirect ⁴
Benton & Brown Inc.	Manufactures asphaltic bituminous hot mix paving materials	Direct ⁵
Bossier Sign Co. Inc.	Electrical, plastic and aluminum signs, security and parking lot lights and crane rental service	Indirect ⁶
Custom Heat Treating Inc.	Metal heat treating, case hardening, coating and tempering	Indirect ⁷

¹ This facility is a sales office from a residential residence. The discharge is sanitary wastewater only.

² The process wastewater discharges from this facility are authorized under LDEQ General Permit LAG110085.

³ The process wastewater discharge from this facility is subject to pretreatment categorical standard 40 CFR Part 417.166, Soap and Detergent Manufacturing. The Control Authority (CA) has permitted this facility as a Categorical Industrial User (CIU).

⁴ The discharge is process and sanitary wastewater; however, pretreatment standards have not been developed for this industry. The CA has permitted this facility as a Significant Industrial User (SIU).

⁵ The process wastewater discharges from this facility are authorized under LDEQ General Permit LAG110096.

⁶ The discharge is sanitary wastewater only.

⁷ Facility has a quenching operation, but it does not discharge to the sanitary sewer system. There is no discharge from the quenching operation. The discharge is sanitary wastewater only.

Melissa Reboul - 2/23/2006

Industry Name	Type of Industry	Direct or Indirect Discharger
GFRC Shelters	Manufactures prefabricated portable concrete buildings	Indirect ⁸
Jones Environmental/Navarre Services	Centralized waste treatment	Indirect ⁹
Key Energy Services	Oil field service	Indirect ¹⁰
Martin Transport	Transportation equipment cleaning	Indirect ¹¹
Schlumberger	Oil field service	Indirect ¹⁰
Superior Well Service	Oil field service	Indirect ¹⁰
TXI Corp.	Manufactures and delivers ready-mixed concrete	Direct ¹²

STANDARD LANGUAGE RECOMMENDATION AND JUSTIFICATION:

The City of Bossier City began implementing an approved pretreatment program on January 25, 1983 and this program is tracked under LA0053716. The Bossier City Pretreatment Program was modified on January 22, 1993 to incorporate an Enforcement Response Plan. A pretreatment audit of this program was conducted on November 6-8, 2002, and it indicated that the program is being implemented in a manner sufficient to regulate the industries listed above.

Therefore, it is recommended that LDEQ Option 2A Pretreatment Language be included in LPDES Permit LA0053716. This language is established for municipalities with industrial users on their collection system and with an approved pretreatment program. This recommendation is in accordance with 40 CFR Part 403 Regulations and the Best Professional Judgement (BPJ) of the reviewer.

⁸ The discharge is sanitary wastewater only.

⁹ The process wastewater discharge from this facility is subject to pretreatment categorical standard 40 CFR Part 437.25, Centralized Waste Treatment. The CA has permitted this facility as a Categorical Industrial User (CIU).

¹⁰ The discharge is process and sanitary wastewater; however, pretreatment standards have not been developed for this industry. The CA has permitted this facility as a Significant Industrial User (SIU).

¹¹ The process wastewater discharge from this facility is subject to pretreatment categorical standard 40 CFR Part 442.15, Transportation Equipment Cleaning. The CA has permitted this facility as a CIU.

¹² The process wastewater discharges from this facility are authorized under LDEQ General Permit LAG110003.

Melissa Reboul – 2/23/2006

FREQUENCY REDUCTION CHART

Company: City of Bossier City
 Facility: Red River WWTP
 Permit No. LA0053716
 Ending Date: Jan-06

Table 1

Date	BOD		TSS		Fecal Coliform	
	Avg	Max	Avg	Max	Avg	Max
Dec-05	4.4	5.4	4.1	5.1	3	4
Nov-05	4.3	6.8	4.5	6.6	16	23
Oct-05	2.7	3.1	2.6	3	5	5
Sep-05	4.4	7.7	5	10	6	8
Aug-05	4.4	5.9	4.2	5.5	6	14
Jul-05	3.3	3.9	3.8	5.3	7	22
Jun-05	3	3.6	3	4.8	6	32
May-05	3.4	4.1	3.1	4.4	5	10
Apr-05	2.7	3.8	2.4	3.3	4	7
Mar-05	3.2	3.8	3.4	5	5	10
Feb-05	3	3.1	3.5	4.1	7	11
Jan-05	2.9	2.9	3.1	4	2	5
Dec-04	3.3	3.7	3.9	4.6	5	8
Nov-04	3.3	4	4.3	5.9	4	8
Oct-04	3.3	3.8	2.8	4.3	7	77
Sep-04	2.7	3	2.8	3.6	6	14
Aug-04	3	3.3	4.5	6.3	5	26
Jul-04	2.6	2.8	2.5	2.7	5	6
Jun-04	3.4	3.6	4.3	4.5	2	10
May-04	3.2	4.6	3.1	5.1	4	19
Apr-04	4.3	5.5	5.6	7	7	49
Mar-04	4.2	5.3	4.5	5.9	2	3
Feb-04	4.3	4.8	4.2	5.6	4	84
Jan-04	4.1	4.2	5	5.3	13	26
Totals	83.4	102.7	90.2	121.9	136	481
Average	3.475	4.279167	3.758333	5.079167	5.666667	20.04167
Limits	30	45	30	45	200	400
LTA	11.58		12.53		2.83	

Ratio of Long Term Effluent Average
to Monthly Average Limit

Baseline Monitoring	Reduce to at LTA %			
75-66%	65-50%	49-25%	<25%	
7/wk	5/wk	4/wk	3/wk	1/wk
6/wk	4/wk	3/wk	2/wk	1/wk
5/wk	4/wk	3/wk	2/wk	1/wk
4/wk	3/wk	2/wk	1/wk	1/wk
3/wk	3/wk	2/wk	1/wk	1/wk
2/wk	2/wk	1/wk	2/mo	1/mo
1/wk	1/wk	1/wk	2/mo	1/2mos
2/mo	2/mo	2/mo	2/mo	1/quarter
1/mo	1/mo	1/mo	1/quarter	1/6mos

(taken from EPA Guidance for Performance Based
Reductions of Monitoring Frequencies, 1996)